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(Building, Geo-Tech & Road Materials Testing Laboratory)

#B9-003, GANGA, Jnanabharathi Enclave,
Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Atterberg Limits

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore.
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS 2720(Part 5):1985
Source / Location	Plant
Sample No.	4, 5 and 6
Date	16.06.2022 to 17.06.2022

Sl. No	Description	Test #4	Test #5	Test #6	IS Specifications
1	Liquid Limit, %	21.99	22.54	21.99	-
2	Plasticity Index, %	Non Plastic	Non Plastic	Non Plastic	6.0% Maximum.

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For Sapience Consultants and Engineers,

SAPIENCE CONSULTANTS & ENGINEERS Bangalore-59

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Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore.
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS 2720(Part 5):1985
Source / Location	Plant
Sample No.	7, 8 and 9
Date	21.06.2022 to 22.06.2022

Sl. No	Description	Test #7	Test #8	Test #9	IS Specifications
1	Liquid Limit, %	21.54	21.4	21.23	-
2	Plasticity Index, %	Non Plastic	Non Plastic	Non Plastic	6.0% Maximum.

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Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore.
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS 2720(Part 5):1985
Source / Location	Plant
Sample No.	10, 11 and 12
Date	22.06.2022 to 23.06.2022

Sl. No	Description	Test #10	Test #11	Test #12	IS Specifications
1	Liquid Limit, %	21.19	21.65	21.57	-
2	Plasticity Index, %	Non Plastic	Non Plastic	Non Plastic	6.0% Maximum.

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Project Management and Consultancy Services

Summary of Frequencies of Field and Laboratory Tests Conducted

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam

Sl. No.	Test Details	Quantity in m^3	Frequency of Tests	Tests Required	Tests Carried Out
1	Quality of Binder	157.09	1 Test / Lot	1	1
2	Aggregate Stripping Value		1 Test / Supply	1	1
3	Specific Gravity and Water Absorption of Aggregates		1 Test / Supply	1	1
4	Aggregate Impact Value		1 Test /200 m^3	1	1
5	Combined Flakiness and Elongation Indices		1 Test / 200 m^3	1	1
6	Aggregate Gradation		2 Test / Day	4	4
7	Marshal Stability of the Mix		2 Tests / Day	4	4
8	Rate of Spread of Tack Coat		2 Tests / Day	4	4
9	Binder Content and Mix Gradation		2 Test / Day	4	4
10	Control of Temperature		Regular Intervals	-	-

Contractor / Agency

Assistant Engineer

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Assistant Executive Engineer

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Quality of Binder

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Concrete
Material	VG-30 grade Bitumen
Source / Location	Plant
Date	11.07.2022

The results of the tests conducted on the bitumen sample using for VG-30 Bitumen

Sl. No	Description	Test #1	Test #2	Requirement as per IS:73:2013
1	Penetration at 25 ^{o}C, 1/10 mm	63	61	50 - 70
2	Softening point, ^{o}C	57.1	55.7	> 47
3	Specific Gravity	1.1	1.2	Min 0.97
4	Ductility at 25°C, cm	96	97	> 40
5	Flash Point, ^{o}C	325	316	> 220

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Aggregate Stripping Value

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	VG-30 grade Bitumen
Test Method	IS : 6241 - 1974 & Specification for Road & Bridge Works, MORTH, Revision - V
Type of binder	VG-30 grade Bitumen
% of Binder Used	4.50 % by weight
Weight of Aggregate	500 gms
Weight of Binder	22.50 gms
Water Bath Temp.	40^0 C
Source / Location	Plant
Sample No.	1
Date	11.07.2022

Observation No	Stripping Percentage	Average Percentage	Average Retained Coating (%)
1	3.96	3.77	96.62
2	3.57		
3	3.77		

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Comments: Minimum Allowable Aggregate Stripping Value for Bituminous Concrete is 95%

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Specific Gravity and Water Absorption

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 3):1963
Source / Location	Plant
Sample No.	1
Date	11.07.2022 to 12.07.2022

Sl. No.	Description	Notion	Test #1	Test #2	Test #3	Mean Value
1	Weight of aggregate suspended in water with the basket	W_1 g	2019	2022	2022	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1267	1267	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2013	2014	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	747	746	747	
6	Weight of oven dried aggregate	W_4 g	1996	2002	2002	
7	Specific Gravity	$W_4/(W_3-W_s)$	2.672	2.684	2.680	2.68
8	Apparent Specific Gravity	$W_4/(W_4-W_s)$	2.727	2.724	2.724	2.72
9	Water Absorption	$((W_3 - W_4) * 100)/W_4$	0.75%	0.55%	0.60%	0.63%

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→ Maximum allowable Aggregate Water absorption value for Dense Bituminous Macadam is 2.0% (MORTH table 500.16)

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Aggregate Impact Value

Project Name	Restoration and Improvements of roads and drains In A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages In ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS : 2386 (Part - IV) 1963
Source / Location	Plant
Sample No.	1
Date	12.07.2022

Sl. No.	Details	Test No.		Average Aggregate Impact Value
		1	2	
1	Weight of Empty Cylinder (in gms) W1	868	868	19.00%
2	Weight of cylinder filled with sample (in gms) W2	1167	1161	
3	Weight of Sample (in gms) = (W2 - W1) W3	299	293	
4	Weight of Sample passing through 2.36mm IS sieve after impact (in gms) W4	53	59	
5	Weight of Sample retained in 2.36mm IS sieve after impact (in gms) W5	246	234	
6	Aggregate Impact Value in Percentage	18.00%	20.00%	

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→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 27% (MORTH table no.500.16)

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Aggregate Particle Shape

Project Name	Restoration and Improvements of roads and drains In A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 1) 1963 (RA 2011)
Source / Location	Plant
Sample No.	1, 2 and 3
Date	12.07.2022

Sl. No.	Test	1	2	3	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.00	10.40	10.00	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	Elongation Index	10.30	12.00	9.30	
3	Combined Flakiness & Elongation index	21.30	22.40	19.30	

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Aggregate Gradation

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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 1) 1963 (RA 2011)
Source / Location	Plant
Sample No.	1 & 2
Date	18.07.2022

Total Weight of Sample (gms) : **10000.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained (gm)	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	279.3	279.3	2.79	97.21	95 - 100	
19.00	2704.4	2983.7	29.84	70.16	60 - 80	
13.20	1760.9	4744.6	47.45	52.55	40 - 60	
4.75	1652.1	6396.7	63.97	36.03	25 - 40	
2.36	1392.1	7788.8	77.89	22.11	15 - 30	
0.300	490.5	8279.3	82.79	17.21	8 - 22	
0.075	1502.5	9781.8	97.82	2.18	0 - 5	

Total Weight of Sample (gms) : **10000.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained (gm)	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	465.2	465.2	4.65	95.35	95 - 100	
19.00	2234.2	2699.4	26.99	73.01	60 - 80	
13.20	2046.7	4746.1	47.46	52.54	40 - 60	
4.75	1497.3	6243.4	62.43	37.57	25 - 40	
2.36	1684.1	7927.5	79.28	20.72	15 - 30	
0.300	773.4	8700.9	87.01	12.99	8 - 22	
0.075	1041.9	9742.8	97.43	2.57	0 - 5	

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Aggregate Gradation

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Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 1) 1963 (RA 2011)
Source / Location	Plant
Sample No.	3 & 4
Date	19.07.2022

Total Weight of Sample (gms) : **10000.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained (gm)	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	461.1	461.1	4.61	95.39	95 - 100	
19.00	2509.4	2970.5	29.71	70.29	60 - 80	
13.20	2137.1	5107.6	51.08	48.92	40 - 60	
4.75	1723.4	6831.0	68.31	31.69	25 - 40	
2.36	1280.4	8111.4	81.11	18.89	15 - 30	
0.300	227.0	8338.4	83.38	16.62	8 - 22	
0.075	1291.5	9629.9	96.3	3.7	0 - 5	

Total Weight of Sample (gms) : **10000.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained (gm)	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	206.3	206.3	2.06	97.94	95 - 100	
19.00	2682.4	2888.7	28.89	71.11	60 - 80	
13.20	1546.2	4434.9	44.35	55.65	40 - 60	
4.75	2586.4	7021.3	70.21	29.79	25 - 40	
2.36	596.5	7617.8	76.18	23.82	15 - 30	
0.300	1064.4	8682.2	86.82	13.18	8 - 22	
0.075	1087.4	9769.6	97.70	2.30	0 - 5	

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For Sapience Consultants and Engineers,

SAPIENCE CONSULTANTS ENGINEERS Bangalore-59

Authorized Signature

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#B9-003, GANGA, Jnanabharathi Enclave,
Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Marshall Stability

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 3):1963
Source / Location	Plant
Sample No.	1 & 2
Date	18.07.2022

Sl. No.	Properties	Test #1	Test #2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability value at 600C in KGs	1317.00	1318.00	> 900
2	Marshal flow, mm	3.38	3.69	2 - 4
3	Percent air voids in Mineral Aggregate	3.66	3.24	13 - 15
4	Voids in Compacted Mix	5.37	5.21	3 - 6
5	Percent voids in mineral aggregate (VMA)	12.06	11.22	11 - 13
6	Density, g/cc	2.39	2.62	---

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Email: sapiencebangalore@gmail.com

Marshall Stability

Project Name	Restoration and Improvements of roads and drains in K F 4 Layout, Shettyhalli village,R4 layout of Chikkasandra village and Kbigere village roads, ATS Village, Vishveshwarlah village, Royal Enclave and Sidedahalli Old Village roads Dugged by RWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli, BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore
Job No.	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri Chikkaboregowda Karigowda(CKG Constructions Private Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part 3) 1963
Source / Location	Plant
Sample No	3 & 4
Date	19.07.2022

Sl. No	Properties	Test #3	Test #4	Requirement as per MORTH (Table 500-19)
1	Marshall Stability value at 600C in KGs	1311.00	1316.00	> 900
2	Marshal flow, mm	2.85	2.93	2 - 4
3	Percent air voids in Mineral Aggregate	3.77	4.94	13 - 15
4	Voids in Compacted Mix	5.11	5.35	3 - 6
5	Percent voids in mineral aggregate (VMA)	12.29	12.76	11 - 13
6	Density, g/cc	3.06	2.12	---

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For Sapience Consultants and Engineers,

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Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Rate of Spread of Tack Coat

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	80/100 grade bitumen(VG10)
Material	Tack Coat
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	18.07.2022

Sl. No.	Description	Unit	Test #1		Test #2	
			Tray - 1	Tray - 2	Tray - 1	Tray - 2
1	Size of Plate (mxn)	m^2	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3
2	Area of the Plate (a)	m^2	0.09	0.09	0.09	0.09
3	Initial weight of the empty plate (b)	kg	2.787	2.853	2.787	2.853
4	Final weight of plate after application of Tack Coat C	kg	2.809	2.875	2.809	2.875
5	Weight of Tack Coat (d = c-b)	kg	0.022	0.022	0.022	0.022
6	Rate of Spread (d/a)	kg / m^2	0.24	0.24	0.24	0.24
7	Average	kg / m^2	**0.24**		**0.24**	
8	Specified Limit	kg / m^2	Not Less than 0.25 kg / m^2			

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Rate of Spread of Tack Coat

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	80/100 grade bitumen(VG10)
Material	Tack Coat
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	19.07.2022

Sl. No.	Description	Unit	Test #3		Test #4	
			Tray - 1	Tray - 2	Tray - 1	Tray - 2
1	Size of Plate (mxn)	m^2	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3
2	Area of the Plate (a)	m^2	0.09	0.09	0.09	0.09
3	Initial weight of the empty plate (b)	kg	2.787	2.853	2.787	2.853
4	Final weight of plate after application of Tack Coat C	kg	2.809	2.876	2.811	2.877
5	Weight of Tack Coat (d = c-b)	kg	0.022	0.023	0.024	0.024
6	Rate of Spread (d/a)	kg / m^2	0.24	0.26	0.27	0.27
7	Average	kg / m^2	**0.25**		**0.27**	
8	Specified Limit	kg / m^2	Not Less than 0.25 kg / m^2			

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A V R Layout, Shettyhalli village As layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwaraiah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli, BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.	SCE/PMC/OCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Dense Bituminous Macadam Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	18.07.2022

Sl. No	Description	Test #1	Test #2
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	6.00	6.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	2.00	2.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	476.00	476.00
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	478.00	478.00
7	Wt. of Bitumen B= M-A in gms.	22.00	22.00
8	% of Bitumen Content (B/M)x100	4.40	4.40
9	Average	4.40%	

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Email: sapiencebangalore@gmail.com

Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	18.07.2022

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	14.5	14.5	3.05	96.95	95 - 100	
19.00	14.0	28.5	5.99	94.01	6.00	
13.20	193.0	221.5	46.53	53.47	40 - 60	
4.75	475.0	696.5	146.32	-46.32	**25 - 40**	
2.36	-349.9	346.6	72.82	27.18	15 - 30	
0.300	69.6	416.2	87.44	12.56	8 - 22	
0.075	49.5	465.7	97.84	2.16	0 - 5	

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	18.3	18.3	3.84	96.16	95 - 100	
19.00	122.3	140.6	29.54	70.46	60 - 80	
13.20	111.1	251.7	52.88	47.12	40 - 60	
4.75	69.8	321.5	67.54	32.46	25 - 40	
2.36	65.2	386.7	81.24	18.76	15 - 30	
0.300	-5.6	381.1	80.06	19.94	8 - 22	
0.075	77.2	458.3	96.28	3.72	0 - 5	

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For Sapience Consultants and Engineers,

SAPIENCE CONSULTANTS & ENGINEERS * Bangalore-59

Authorized Signatory

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Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Dense Bituminous Macadam Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	18.07.2022

Sl. No.	Description	Test #3	Test #4
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	5.00	6.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms	1.00	2.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	475.00	476.00
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	476.00	478.00
7	Wt. of Bitumen B= M-A in gms.	24.00	22.00
8	% of Bitumen Content (B/M)x100	4.80	4.40
9	Average	4.60%	

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	18.07.2022

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	22.5	22.5	4.73	95.27	95 - 100	
19.00	6.1	28.6	6.01	93.99	6.00	
13.20	181.4	210.0	44.12	55.88	40 - 60	
4.75	476.0	686.0	144.12	-44.12	**25 - 40**	
2.36	-305.0	381.0	80.04	19.96	15 - 30	
0.300	26.5	407.5	85.61	14.39	8 - 22	
0.075	58.4	465.9	97.88	2.12	0 - 5	

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	10.8	10.8	2.27	97.73	95 - 100	
19.00	128.7	139.5	29.31	70.69	60 - 80	
13.20	74.4	213.9	44.94	55.06	40 - 60	
4.75	87.9	301.8	63.40	36.60	25 - 40	
2.36	72.4	374.2	78.61	21.39	15 - 30	
0.300	42.6	416.8	87.56	12.44	8 - 22	
0.075	48.3	465.1	97.71	2.29	0 - 5	

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Dense Bituminous Macadam Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	5 & 6
Date	19.07.2022

Sl. No.	Description	Test #5	Test #6
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	5.00	6.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	1.00	2.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	**476.00**	**475.00**
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	477.00	477.00
7	Wt. of Bitumen B= M-A in gms.	23.00	23.00
8	% of Bitumen Content (B/M)x100	4.60	4.60
9	Average	4.60%	

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ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶಿಡ್ಲಘಟ್ಟ ಉಪವಿಭಾಗ
ಬಿಬಿಎಂಪಿ, ಬೆಂಗಳೂರು

Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	5 & 6
Date	19.07.2022

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	12.0	12.0	2.52	97.48	95 - 100	
19.00	16.6	28.6	6.01	93.99	60 - 80	
13.20	190.7	219.3	46.07	53.93	40 - 60	
4.75	475.0	694.3	145.86	-45.86	**25 - 40**	
2.36	-310.0	384.3	80.74	19.26	15 - 30	
0.300	4.6	388.9	81.7	18.30	8 - 22	
0.075	71.0	459.9	96.62	3.38	0 - 5	

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	17.3	17.3	3.63	96.37	95 - 100	
19.00	126.9	144.2	30.29	69.71	60 - 80	
13.20	66.6	210.8	44.29	55.71	40 - 60	
4.75	92.7	303.5	63.76	36.24	25 - 40	
2.36	56.5	360.0	75.63	24.37	15 - 30	
0.300	41.5	401.5	84.35	15.65	8 - 22	
0.075	64.9	466.4	97.98	2.02	0 - 5	

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#B9-003, GANGA, Jnanabharathi Enclave ... 560059

Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Dense Bituminous Macadam Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	7 & 8
Date	19.07.2022

Sl. No.	Description	Test #7	Test #8
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	6.00	6.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	2.00	2.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	**475.00**	**475.00**
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	477.00	477.00
7	Wt. of Bitumen B= M-A in gms.	23.00	23.00
8	% of Bitumen Content (B/M)x100	4.60	4.60
9	Average	4.60%	

Note:

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwarlah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	7 & 8
Date	19.07.2022

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	16.2	16.2	3.4	96.60	95 - 100	
19.00	12.4	28.6	6.01	93.99	6.00	
13.20	194.1	222.7	46.79	53.21	40 - 60	
4.75	475.0	697.7	146.58	-46.58	**25 - 40**	
2.36	-344.9	352.8	74.12	25.88	15 - 30	
0.300	34.2	387.0	81.3	18.70	8 - 22	
0.075	76.5	463.5	97.37	2.63	0 - 5	

Weight of Sample after test (gms) : **476.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
37.50	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Dense Bituminous Macadam
26.50	12.7	12.7	2.67	97.33	95 - 100	
19.00	95.6	108.3	22.75	77.25	60 - 80	
13.20	142.2	250.5	52.63	47.37	40 - 60	
4.75	73.4	323.9	68.05	31.95	25 - 40	
2.36	60.1	384.0	80.67	19.33	15 - 30	
0.300	32.6	416.6	87.52	12.48	8 - 22	
0.075	43.9	460.5	96.74	3.26	0 - 5	

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Project Management and Consultancy Services

Summary of Frequencies of Field and Laboratory Tests Conducted

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete

Sl. No.	Test Details	Quantity in m^3	Frequency of Tests	Tests Required	Tests Carried Out
1	Quality of Binder	94.26	1 Test / Lot	1	1
2	Aggregate Stripping Value		1 Test / Supply	1	1
3	Specific Gravity and Water Absorption of Aggregates		1 Test / Supply	1	1
4	Aggregate Impact Value		1 Test / 200 m^3	1	1
5	Combined Flakiness and Elongation Indices		1 Test / 200 m^3	1	1
6	Aggregate Gradation		2 Test / Day	4	4
7	Marshal Stability of the Mix		2 Tests / Day	4	4
8	Rate of Spread of Tack Coat		2 Tests / Day	4	4
9	Binder Content and Mix Gradation		2 Test / Day	4	4
10	Control of Temperature		Regular Intervals	-	-

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Quality of Binder

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	VG-30 grade Bitumen
Source / Location	Plant
Date	13.07.2022

The results of the tests conducted on the bitumen sample using for VG-30 Bitumen

Sl. No	Description	Test #1	Test #2	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	62	61	50 - 70
2	Softening point, °C	55.3	56.6	> 47
3	Specific Gravity	1.2	1.2	Min 0.97
4	Ductility at 25°C, cm	98	99	> 40
5	Flash Point, °C	316	315	> 220

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Aggregate Stripping Value

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	VG-30 grade Bitumen
Test Method	IS : 6241 - 1974 & Specification for Road & Bridge Works, MORTH, Revision - V
Type of binder	VG-30 grade Bitumen
% of Binder Used	5.4% by weight
Weight of Aggregate	500 gms
Weight of Binder	27 gms
Water Bath Temp.	40^0 C
Source / Location	Plant
Sample No.	1
Date	13.07.2022

Observation No	Stripping Percentage	Average Percentage	Average Retained Coating (%)
1	3.51	3.69	97.21
2	3.58		
3	3.99		

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Comments: Minimum Allowable Aggregate Stripping Value for Bituminous Concrete is 95%

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Specific Gravity and Water Absorption

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS 2386(Part 3):1963
Source / Location	Plant
Sample No.	1
Date	13.07.2022 to 14.07.2022

Sl. No.	Description	Notion	Test #1	Test #2	Test #3	Mean Value
1	Weight of aggregate suspended in water with the basket	W_1 g	2023	2022	2019	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1268	1267	1264	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2012	2009	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	743	745	745	
6	Weight of oven dried aggregate	W_4 g	1997	2000	1997	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.688	2.685	2.681	2.68
8	Apparent Specific Gravity	$W_4/(W_4-W_S)$	2.739	2.729	2.724	2.73
9	Water Absorption	$((W_3 - W_4) * 100)/W_4$	0.70%	0.60%	0.60%	0.63%

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→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0% (MORTH table 500.16)

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Bituminous Concrete Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	5 & 6
Date	21.07.2022

Sl. No.	Description	Test #5	Test #6
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	5.00	5.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	1.00	1.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	**471.00**	**472.00**
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	472.00	473.00
7	Wt. of Bitumen B= M-A in gms.	28.00	27.00
8	% of Bitumen Content (B/M)x100	5.60	5.40

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	5 & 6
Date	21.07.2022

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	37.0	37.0	7.84	92.16	90 - 100	
9.5	74.6	111.6	23.64	76.36	70 - 88	
4.75	62.0	173.6	36.78	63.22	53 - 71	
2.36	68.1	241.7	51.21	48.79	42 - 58	
1.18	36.7	278.4	58.98	41.02	34 - 48	
0.600	56.6	335.0	70.97	29.03	26 - 38	
0.300	32.5	367.5	77.86	22.14	18 - 28	
0.150	28.7	396.2	83.94	16.06	12 - 20	
0.075	49.2	445.4	94.36	5.64	4 - 10	

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	27.0	27.0	5.72	94.28	90 - 100	
9.5	81.0	108.0	22.88	77.12	70 - 88	
4.75	63.4	171.4	36.31	63.69	53 - 71	
2.36	58.8	230.2	48.77	51.23	42 - 58	
1.18	57.6	287.8	60.97	39.03	34 - 48	
0.600	28.8	316.6	67.08	32.92	26 - 38	
0.300	38.0	354.6	75.13	24.87	18 - 28	
0.150	41.5	396.1	83.92	16.08	12 - 20	
0.075	49.7	445.8	94.45	5.55	4 - 10	

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Binder Content and Mix Gradation

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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Bituminous Concrete Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	7 & 8
Date	21.07.2022

Sl. No.	Description	Test #7	Test #8
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	4.00	5.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	0.00	1.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	**471.00**	**472.00**
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	471.00	473.00
7	Wt. of Bitumen B= M-A in gms.	29.00	27.00
8	% of Bitumen Content (B/M)x100	5.80	5.40

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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	7 & 8
Date	21.07.2022

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	24.9	24.9	5.28	94.72	90 - 100	
9.5	74.7	99.6	21.1	78.9	70 - 88	
4.75	72.2	171.8	36.4	63.6	53 - 71	
2.36	64.6	236.4	50.08	49.92	42 - 58	
1.18	42.6	279.0	59.11	40.89	34 - 48	
0.600	58.4	337.4	71.48	28.52	26 - 38	
0.300	22.1	359.5	76.17	23.83	18 - 28	
0.150	48.0	407.5	86.33	13.67	12 - 20	
0.075	39.6	447.1	94.72	5.28	4 - 10	

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	27.3	27.3	5.78	94.22	90 - 100	
9.5	66.1	93.4	19.79	80.21	70 - 88	
4.75	98.2	191.6	40.59	59.41	53 - 71	
2.36	36.9	228.5	48.41	51.59	42 - 58	
1.18	63.9	292.4	61.95	38.05	34 - 48	
0.600	37.4	329.8	69.87	30.13	26 - 38	
0.300	43.5	373.3	79.09	20.91	18 - 28	
0.150	14.5	387.8	82.16	17.84	12 - 20	
0.075	54.9	442.7	93.79	6.21	4 - 10	

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SAPIENCE CONSULTANTS & ENGINEERS Bangalore-59

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ದಾಸರಹಳ್ಳಿ ಉಪವಿಭಾಗ
ಬಿಬಿಎಂಪಿ, ಬೆಂಗಳೂರು

sapience
Consultants and Engineers
(Building, Geo-Tech & Road Materials Testing Laboratory)

#B9-003, GANGA, Jnanabharathi Enclave,
Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Binder Content and Mix Gradation

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
Client	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-2/BBMP/DH/2022-23/57 Dt. 27/07/2022
Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Bituminous Concrete Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	20.07.2022

Sl. No.	Description	Test #3	Test #4
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	4.00	5.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	0.00	1.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	**471.00**	**471.00**
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	471.00	472.00
7	Wt. of Bitumen B= M-A in gms.	29.00	28.00
8	% of Bitumen Content (B/M)x100	5.80	5.60

Note:
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Aggregate Impact Value

Project Name	Restoration and Improvements of roads and drains in A Y R Layout, Shettyhalli village,RR layout of Chikkasandra village and Abigere village roads, BTS Village, Vishveshwariah village, Royal Enclave and Sidedahalli Old Village roads Dugged by BWSSB to lay water Supply and UGD lines under 110 villages in ward No 12 & 14 Shettyhalli. BBMP, Bangalore
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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS : 2386 (Part - IV) 1963
Source / Location	Plant
Sample No.	1
Date	13.07.2022

Sl. No.	Details	Test No.		Average Aggregate Impact Value
		1	2	
1	Weight of Empty Cylinder (in gms) W1	868	868	13.50%
	Weight of cylinder filled with sample (in gms) W2	1172	1172	
2	Weight of Sample (in gms) = (W2 - W1) W3	304	304	
	Weight of Sample passing through 2.36mm IS sieve after impact (in gms) W4	40	43	
	Weight of Sample retained in 2.36mm IS sieve after impact (in gms) W5	264	261	
3	Aggregate Impact Value in Percentage	13.00%	14.00%	

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→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Aggregate Particle Shape

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Contractor / Agency	Sri.Chikkaboregowda Karigowda(CKG Constructions Privite Limited), Contractor, Mysore
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS 2386(Part 1) 1963 (RA 2011)
Source / Location	Plant
Sample No.	1
Date	13.07.2022

Sl. No.	Test	1	2	3	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	9.80	11.40	11.40	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	11.80	11.90	11.10	
3	Combined Flakiness & Elongation index	21.60	23.30	22.50	

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